Management Strategies: the difficulty in studying this species is reflected in the lack of information specifically on age and sex distribution, effects of trapping and population viability. Without concrete information these points are offered for consideration in project analysis:

-maintain low open road densities (>1 mile per square mile) will reduce easy access to trapping and thus reduce a significant impact to wolverine

-Management Situation I grizzly bear habitat guidelines are thought to provide appropriate management guidelines for wolverine in addressing clearcut sizes and road densities.

-because wolverine are susceptible to trapping, scent and bait trapping should be prohibited in areas where wolverine expansion is desired (Hash, 1988).

-maintain and enhance wintering ungulate populations in remote areas, inaccessible to trapping pressure or concentrated human use

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FLAMMULATED OWL (Otus flammeolus)

Habitat Type: found in areas with mature ponderosa pine and Douglas fir with low stand density and moderately open canopies (35-65%). The understory is typically very open, largely covered with bluebunch wheat grass, pinegrass, spirea and some large shrubs or clumps of regenerating trees. Low elevation riparian areas that lead into cottonwood or aspen stands may be used for nesting due to their potential for cavities. The known elevational range of this owl includes; 1,200 to 4,000 ft. (Campbell et. al. 1990, B.C. Canada), 4,500 to 7,500 ft. (Atkinson et. al., 1991, Central Idaho), and 2,400 to 4,000 ft. (Marcot et. al. 1980, N. California). Smith (1980) though unreported, thought flammulated owls may rarely be found in western spruce/alpine fir stands. Nests trees have been located in or adjacent to small clearings with dense timber surrounding or close by (Bull, et. al., 1978). They have also been recorded as using nest boxes (Campbell, et. el. 1990)

Unique Biological/Ecological Features: obligate cavity nesting species. The flammulated owl uses both natural cavities or those made by pileated woodpeckers and northern flickers. Cavities have been found in live and dead DF, aspen and ponderosa pine ranging from 12-25" in dbh. A number of measured owl cavities have been found about 40-50' high in the nest tree. Insectivorous, this species feeds on small to medium size beetles, moths, catepillars and crickets. A forb

USDA Forest Service. 1992. Interim management recommendations: sensitive species. Region 1, USDA Forest Service. 18 pp.

component in the understory is important forage for many of these prey species of the owl. Nocturnal feeders, the flammulated owl gleans insects from among tree branches and shrub foliage or pouncing on ground insects from a perch. Nesting territories are documented between 20-60 acres in size (Goggans, 1986 and Reynolds, et. al. 1987). Flammulated owls may form loose "colonial" groups or congregations (10 territorial males in 3-240 acre area) for the purposes of breeding (Marcot, et.al., 1980).

Sensitive Species Criteria: FS sensitive in MT and ID (Regions 1 and 4). Known to occur on all forests in the Northern Region but the Custer NF.

Demographics/Scale: migratory in the northern end of their range wintering in Mexico and Central America. Holt, et. al. found 4 records of wintering flammulated owls in Montana. Breeding occurs in May followed by egg laying by early June. The young fledge 22-25 days after hatching, (July 20-27, Reynolds and Linkhart and July 25 - August 16, Bull and Anderson) and disperse from their natal area by September. Adults have been noted leaving their territories from mid-September to mid-October depending upon their location.

Limiting Factors/Effects: management that would reduce prey density and availability could impact the density and reproductive potential of flammulated owls. This may include alteration to the structure and compositon of the overstory and understory. Flammulated owls showed a significant preference for foraging in old growth pine-fir patches and avoiding young (<100 yr), denser stands of DF and blue/spruce (Reynolds, et. al. 1987). Flammulated owls also appear to avoid clearcuts and intensively cutover areas (Wash. Dept. Wildlife, 1991). Timber and fire management practices that would reduce the availability and density of mature ponderosa pine or cavity producing trees (snags) may threaten flammulated owl populations and distribution.

Management Strategies:

-maintain condition (forb) and distribution of natural grasslands (up to 5 acres in size) for foraging habitat, particularily in densely forested area. Use of herbicides in natural openings may reduce forbs and shrubs necessary for prey habitat. Consider that flammulated owls have been known to forag .5 miles from their nest.

-provide forest buffer zones around montane openings. A specific distance has not been proposed however, attempt to tie buffer zones to larger, unmodified mature forest stands.

-when designing clearcuts (size and distribution) consider that flammulated owls are thought not as likely to forage beyond 300' from a forested environment into a clearing (Goggan). Manage for openings < 5 acres in size.

-retain all snags during logging and silvicultural treatments and offset losses of snags to fuelwood through planning

-maintain some silvicultural units in open, uneven-aged conifer at high stocking levels

-manage for old growth and mature (100 yr old) ponderosa pine and DF stands with at least 5 large snags or decaying trees/acre. These stands should be no less than 50 acres in size. Manage these stands to maintain a moderately open understory of forbs and shrubs that would enhance prey abundance. Multi-layered canopies are preferred.

-maitian dense, mature trees near brushy opening

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BOREAL OWL (Aegolius funereus)

HabitatTvpe: Spruce fir forests above 5,000' elevation (Hayward, southcentral Idaho). This habitat type is expected to be dominated by subalpine fir, Abies lasiocarpa, over time. Documented communities used by owls include Pinus ponderosa, Douglas fir and Populus tremuloides within the Abies life zone.

Unique Ecological /Biological Features: The owls association with the spruce/subapline life zone is thought to be related to thermoregulation. This life zone is also noted as being dominated by mammalian predators leaving some what of a niche for avian predators such as the boreal. Forested areas with trees of pole size and greater provide available foraging habitat. Stands with dense shrub or regeneration in the understory do not provide the open area needed for the boreal to pursue its prey. As a secondary cavity nester adequate and large (pileated or northern flicker size) cavities are needed. Smaller cavities created by Downy or Hairy woodpeckers can be used if enlarged by